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ABSTRACT

The author examines the current state of research on teaching and argues that the technique of "grounded theory," a method for discovering theory from data, would be an effective means for improving theoretical bases of teaching. The meanings of "theory" and "theory building" are discussed, including what theory is, the forms it can take, and alternative methods for its construction. The paucity of theoretical effort in current research on teaching is attributed to misconceptions of its scope (i.e., that theory must be all inclusive) and role (a product rather than a process). Glaser and Strauss are cited as the foremost proponents of grounded theory, and the basic components of their research/theory process are described. Two examples of the use of grounded theory in recent educational research are given. A concluding argument is presented: that grounded theory, in addition to being an effective descriptive tool, may also be an effective method for the generation of prescriptive theory. Use of the process in this latter role would aid in the establishment of a dialectic between educational research and educational practice. (HJB)

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FIELDWORK AS BASIS FOR THEORY BUILDING IN RESEARCH ON TEACHING [1]

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I shall have two major points. First, research on teaching is in need of a healthy dose of theory building to more clearly conceptualize the nature of the enterprise that we intend to improve through research. Second, grounded theory, as a method of generating theory from field-work, is an effective means to begin this undertaking. Before directly addressing these two points, it may be helpful to discuss what it is that we mean by theory and theory building.

Forms of Theory

A goal of all scientific disciplines is to link together lower-order generalizations, or propositions, into larger, systematic networks of propositions that will enable the explanation and prediction of phenomena within a given domain. Such networks of propositions are generally referred to as theories. Although definitions of theory appear to be almost as numerous as people concerned with it, theory, in its simplest form, consists of: (a) a set of units, facts, propositions, variables, and (b) a system of relationships among the units (Snow, 1973).

Many different forms, or types, of theory have been proposed from a number of different perspectives. Theory has been examined, for example, from the point of view of philosophy (Nagel, 1969; Turner, 1967), sociology (Merton, 1957, 1967; Zetterberg, 1965), psychology (Boring, 1963; Marx, 1963; Snow, 1973), and social science in general (Kaplan, 1964). A common characteristic of nearly all of these viewpoints is that theory exists in many forms varying primarily in the degree to which it is formalized and systematized. To illustrate this continuum, two classification schemes that have been recently applied to the examination of

educational theory will be briefly discussed.

The first classification scheme is the four senses of theory identified by Nagel (1969). These senses of theory were recently used by Kliebard (1977) to examine the current status of curriculum theory. Nagel first refers to theory in the sense of a system of universal statements. Such a system is generally removed from actual phenomena but is amenable to explaining established regularities in the real world and to predicting with varying degress of precision individual occurrences. Newtonian mechanics in relation to gravity, current quantum mechanics, evolutionary theory, and the marginal theory of utility in economics are mentioned as examples of this sense of theory. Nagel acknowledges that theories of this nature are relatively rare and have only been recently achieved in the more advanced natural sciences.

The second sense of theory is somewhat more restrictive than the first and refers to an individual law or generalization. Theory in this sense is largely made up of single statements asserting some relation of dependence between variables. Examples are Boyle's Law in Physics, Grimm's Law in Linguistics, and the Law of Effect in Psychology. Though these theories cover a smaller domain than theory in the first sense, they are basically of the same order and their credibility and acceptance depend to a large degree on empirical verification.

The third sense of theory identified by Nagel is less systematic in that it refers to neither a set of systematically organized statements nor a single explicitly formulated generalization. Theory in this sense is an attempt to identify and designate the factors or variables constituting the "major determinates" of the phenomena being investigated.

In other words, major factors and variables are specified without venturing to state explicitly what the relationship is between them. Examples offered for this form of theory are the Kaynesian theory of economics and Parson's general theory of social action.

The fourth and final sense of theory distinguished by Nagel refers to "any more or less systematic analysis of a set of related concepts." (p.10) The main task of this form of theory is to elaborate and clarify initially vague concepts with a goal towards explicating the major components of the problem or question under consideration. In many cases, empirical considerations play only a secondary role in this sense of theory. Nagel provides as an example of this form of theory philosophical theories of knowledge, and Kliebard suggests that current curriculum theory belongs in this category.

A second scheme for classifying theory is proposed by Snow in the Second Handbook for Research on Teaching (1973). There, Snow suggests six grades of theory, based partly on Boring's (1963) fourteen (14) types of theoretical statements. Like Nagel's forms of theory, Snow's six grades of theory progress from more formal and systematic forms to those that are less specific and rigorous. Each of these forms of theory will be briefly characterized below.

Axiomatic Theory. This is referred to as the highest form of theory and is characterized by, (1) a set of primitive, undefined concepts from which all other concepts can be derived, and (2) a set of basic axioms or postulates from which empirically testable theorems can be derived. Snow states that though Axiomatic Theory is rare in contemporary psychology and virtually unknown in education, this level

of theoretical work is a goal to which research should aspire.

Broken Axiomatic Theory. This refers to theory in which the formal system is broken down (e.g., formal theories "on the way out" or theories being broken by continuing research) or to theory not yet completely formalized. This form of theory often results from digestion and reformulation of previous theories or from an eclectic pulling together of previous work. Snow proposes that Broken-Axiomatic Theory may be the highest form of theory to be found in research on teaching for some time to come.

Conceptual Theories and Constructs. This form of theory is a result of the gradual elaboration and refinement of theoretical constructs through research. The result of this process is a conceptual network of constructs as found in Festinger's (1957) theory of cognitive dissonance or Atkinson and Feather's (1966) theory of achievement motivation.

Descriptive Theories and Taxonomies. This grade of theory is characterized by systematic descriptions of phenomena like conceptual theories, but it does not attempt to introduce new theoretical constructs for explanatory purposes. Examples of this form of theoretical workare the taxonomic work of Bloom (1956), Guilford's Structure of Intellect (1967), and Gagne's (1970) types of learning.

Elementisms. The attempt to reduce variables and relations to the most elementary units possible is the distinguishing feature of this grade of theory. This form of analysis is portrayed by Snow as a prerequisite to descriptive theory and taxonomies. In research on teaching, this approach has been proposed by Gage (1963) and attempted by McDonald

and Allan (1967).

Formative Hypotheses. The formulation of hypotheses is identified by Snow as the lowest grade of theory. This refers to the basic ideas and speculations that are the building blocks for future research. The specification of testable hypotheses is the main thrust of this effort, however Snow argues (a la Boring) that untestable hypotheses also have a place in this form of theory.

The conceptual schemes of Nagel and Snow both illustrate the myriad forms in which theory may be generated. Theory is not necessarily relegated to the more formal states of axiomatic and universal statements. Now that we have briefly examined what theory is and the many forms it can take, we may now address the question, how does one do theory?

Theory Building

As one might expect there is not one generally accepted method for doing theory. The topic of theory building has generated as much disagreement and diversity of opinion as have the definition of theory and the specification of forms it can take. One reason for this state of affairs is that the methods for generating and constructing theory are closely related to the general components and methods for doing science. For instance, Marx (1963) proposes that the three basic elements of theory construction are observation, constructs, and hypotheses. For Marx, the process of scientific theory construction involves the progression of observations from everyday to experimental, the development of constructs from those with surplus meaning to those with explicit empirical

referents (operational definitions), and the statement of hypotheses from intuitive forms to more vigorous forms. This striving towards control, operational specificity, and testability is portrayed as the goal of science. This progression of these basic elements has little to say, however, about how theory building is actually carried out. Information is needed, for instance, about how constructs are identified and elaborated, how hypotheses are generated and tested, and how observations (data) relate to conceptualization (theory).

Marx (1963) distinguishes among three modes of theory construction differing primarily in the type of interaction between the conceptual (theory-language) and the empirical (data-language) levels of analysis. The first mode, deductive theorizing, is characterized by an emphasis on a well-defined conceptual structure that suggests hypotheses to be tested by empirical research. Work at the conceptual level of analysis clearly overwhelms work at the empirical level in this mode of theory building, and theory is formally constructed based often on minimal empirical grounds. Snow's Axiomatic Theory and Nagel's first sense of theory are often the result of this type of theory building.

The second mode of theorizing identified by Marx is inductive theorizing. Here the direction of interaction is almost solely from the empirical to the conceptual level of analysis, as the primary emphasis is on the acquisition of facts. Theory in this mode consists essentially of summarization of empirical relationships with a minimum of inferential or logical deliberation. The product of inductive theory is a set of general, inductive principles. This mode of theory building seems most amenable to Snow's three lowest grades of theory and to Nagel's third and fourth senses of theory.

Functional theorizing is Marx's third major mode of theory construction. In this mode the interaction between data gathering and conceptualization is two-way, as both types of activity are equally emphasized. Theory building in this mode is closely tied to empirical research and theoretical formulations are rarely taken much further than provisional statements developed to account for empirical findings. This method of theorizing is likely to generate conceptual theories and constructs and possibly Broken-Axiomatic Theories in Snow's classification scheme.

Now that we have briefly examined what theory is, the forms it can take, and alternative methods for its construction, we are ready to address the major points of this discussion. Let us first look at the current status and needs of theory building in research on teaching.

Theory Building in Research on Teaching

"If the object of (educational) research is the development of coherent and workable theories, researchers are nearly as far from that goal today as they are from controlling the weather." This assessment of educational theory was made by Shulman in 1970 (Shulman, 1970, p.371). The fact that we have progressed little from this situation in the last seven years is reflected in the statements by Mitzel in a recent issue of The Journal of Teacher Education (Mitzel, 1977). Mitzel's main thesis is that the practice of education, insofar as it is based on educational research, has moved forward as far as it can go without an infusion of new concepts, new assumptions, and new theory. He argues that the seemingly unproductive findings of schooling research in the last several

decades are due to an inadequate conception of the causative factors in schooling. He goes on to say:

> In education researchers are not providing us with new tested knowledge for increasing pupil learning. A deep running viable theory would help to accomplish this goal if we could establish one that was consistent with the observable phenomena (Mitzel, 1977, p.16).

As one surveys the current status of theory building in research on teaching, one finds little conceptual activity. Any theorizing that is taking place is relegated to the less formal and less systematic end of the theoretical continuum. In my view, this paucity of theoretical effort in current research on teaching can be largely accounted for by two conditions.

The first condition I would call a "fear of the unknown." To most researchers, theory construction is an imposing and threatening task. This is partly due to common conceptions about theory and partly due to a lack of training in thinking about and actually doing theory. Theory to many researchers and certainly most graduate students refers to conceptualization in its most formal and grand states. As students, the only forms of theory that we came in contact with were comprehensive theoretical formulations such as Hull's and Skinner's theories of learning, Piaget's theory of development, and Freud's and Lewin's theories of personality.

Contact with these formal systems also relays an impression about the process of theory building itself; that is, that theorizing is something that is only done by a gifted few, and then only after years of research and deliberation. This impression is reinforced by the lack of discussion and training in theorizing provided by most

graduate education programs. As educational psychologists we are to be sure that our empirical tool kit in one hand is well stocked, though we end up standing rather lopsided because our theoretical tool kit in the other hand is left empty. Thus, when we hear rallying calls to theory building as those by Shulman and by Mitzel, we are for the most part unarmed for the task. We are not quite sure what theory is and we do not know how to do it, so we retreat to what we can do well - empirical research with some occasional theory testing and verification.

The second condition contributing to the lack of theory building in research on teaching today is our general conception about the role of theory in science. Theory is most commonly perceived as an outgrowth of research rather than as a tool for research -- a product rather than a process. The scientific ladder begins at the bottom with empirical observations, and moves up to hypotheses, to lower order propositions, and then to theory. Researchers have been trained to spend a lot of time at the bottom of the ladder making sure the ground is firm before venturing to the higher rungs.

This preoccupation with data gathering has been recently reinforced in research on teaching. As the anthropologists, sociologists, and ecological psychologists have gradually convinced us of the complexity of the teaching endeavor, we have realized the necessity for a lot of work in describing and analyzing the classroom and its activities. Any discomfort that we may have in venturing out of the lab and into the field has been somewhat moderated by a feeling that all we need to do for a while is to merely describe what we see.

This emphasis on a "rich" description of teaching in natural settings has thus far proved to be very valuable in our thinking and research on teaching. A danger of this approach, which has been brought up in recent anthropological discussions, is that it is very easy to be thick on description while being thin on analysis and theorizing. What is needed today in research on teaching is a method of theory construction that can build on this empirical work and at the same time provide theoretical conceptualization that may be used as a research tool to guide further investigation. This brings us to the second point of this discussion; that is, that "grounded theory," as a method of theory building, is an effective avenue to beginning the task of theory construction in research on teaching.

Grounded Theory

When one confronts the task of theory construction two questions seem most salient: How and where do I start? and What am I striving towards? The first question is basically one of method and the second question chiefly involves the issues of scope and form.

What one does in order to build a theory is a difficult and crucial question. Traditionally this question has been passed over or couched in such vague statements as "theory. . .begins with a concept and its associated imagery and generates an array of theoretical problems" (Merton, 1967, p.45). Other advice has focused on conceptual tools such as models and metaphors. One recent example of this latter approach is Snow's (1973) model for theorizing. This model portrays theorizing as a process involving interaction between metaphors, models, and

metatheories. Even though such models offer good conceptual heuristics, one is still confronted with the initial difficulty of good metaphor generation. Snow himself acknowledges the difficulty of the task yet provides only general guidelines for getting from data to metaphor, to model, and to metatheory.

Grounded theory, as a method of theory building, allows one to begin the task of theory construction without the flash of insight, the vivid imagery, or the inventive conceptualiztion needed for other methods. Grounded theory is a method for discovering theory from data. The method has been most thoroughly developed by Glaser and Strauss (1965, 1967) and has until recently been most widely used in sociology.

Glaser and Strauss define theory as a strategy for handling data in research. Theory should (1) provide modes of conceptualization for describing and explaining behavior, (2) provide clear enough categories and hypotheses so that important ones can be verified in present and future research, and (3) be readily understandable by researchers of any view point, by students, and by laymen and practitioners. To meet these requirements, Glaser and Strauss recommend that theory must "fit" the situation being researcherd and "work" when put to use. By this they mean "that the categories must be readily (not forcibly) applicable to and indicated by the data under study . . . (and). . . that they must be meaningfully relevant to and be able to explain the behavior under study" (1967, p.3). They suggest that to meet these criteria, the best approach to take in theory generation is a systematic discovery of theory from social research data.

Glaser and Strauss argue that in addition to the traditional

criteria used for judging the usefulness of a theory (e.g., logical consistency, clarity, parsimony, density, scope, and integration), we should be concerned about how it was generated. They suggest that the quality of a theory is not independent of the method of generation (as some theorists would argue), but that it is likely to be a better theory to the degree that it has been inductively developed from qualitative research.

The research strategy utilized to generate grounded theory is similar to Marx's "functional" theorizing discussed earlier. Grounded theory, like functional theory, involves both inductive and deductive components. Hypotheses and constructs not only arise from the data but are systematically elaborated and refined in relation to the data as the research progresses. Glaser and Strauss stress that theory generation of this type involves a process of research.

The major method advocated for discovering grounded theory is comparative analysis. Comparative analysis is a research strategy developed in sociology and social anthropology. It was pioneered in sociology by theorists such as Weber, Durkheim, and Mannheim, and has been most widely used for theory verification and validation. Comparative analysis as a strategy for theory generation is concerned with two major activities: the generation of conceptual categories and their conceptual properties, and the development of hypotheses about the relations among these categories and their properties.

The way the comparative method works to generate theory can be briefly described as follows. As one becomes immersed in a set of empirical data certain pieces of evidence suggest concepts or conceptual

categories. These conceptual categories are theoretical abstractions about what is going on in the area studied, and can be illustrated by actual data in the study. Once these categories are generated, new data from different groups, situations, and sources are examined and compared to further test the value of the categories and their properties. The aim of this effort is to achieve a diversity among emergent categories and a variety of levels of conceptual generalization.

This comparison of similarities and differences among different groups and situations also aids in the generation of generalized relations among the conceptual categories. These are taken on as hypotheses that are examined in light of further comparisons. Joint collection, coding, and analysis of data is the basic operation of this method, and in this manner research becomes a continuous process of theory generation, elaboration and testing. Theory generation becomes a tool of research by suggesting fruitful areas for further investigation, and the researcher gains confidence in his categories and hypotheses since they have emerged from the data and are continually being refined and reformulated by them. (For a more detailed discussion of this method see Glaser and Strauss, 1967.)

Before moving to two examples of the use of grounded theory in recent educational research, two further aspects of this method should be mentioned. First, since grounded theory is concerned with theoretical conceptualization that "fits" real situations and "works" when put to use, the primary source of data for this type of investigation should be real social encounters. Thus, field work becomes a fundamental basis for theory development. For conceptual categories and hypotheses that have meaning for real situations to emerge, they must be based on

qualitative descriptions of behavior in natural situations. This does not rule out, however, qualitative data from other sources such as questionnaires, interviews, written documents, and other research reports and writings. In applying this method of theory building to research on teaching our central concern should be that our theorizing is grounded in situations that are representative of real settings in which teaching and learning occur. Better yet, theorizing should be grounded in actual teaching/learning situations.

Second, theory building by means of grounded theory has something to say about the scope of theorizing that should be attempted. The fact that grounded theory is closely tied to field data means that the kinds of theories initially emerging from these efforts will be somewhat specific and limited in scope. Grounded theory in research on teaching will not immediately produce "theories of teaching" or even theories of decision making or social interactions. Theory will be more akin to Merton's (1967)"special theories" that are applicable to limited conceptual ranges, or to the "local theories" proposed by Snow (1977). Initially we are more likely to see theories about such things as teacher judgment processes involved in selecting materials, the development of disciplinary strategies by beginning teachers, or effective teaching methods for math instruction in first grade self-contained classrooms. More general theories of teaching and learning will emerge (if they are possible) only through the summarization and integration of many smaller grounded theories. To illustrate the scope of theorizing resulting from grounded theory and to provide examples of how this strategy can be used in research on teaching, two studies

of teaching involving the generation of grounded theory will be briefly described.

Examples of Grounded Theory in Research on Teaching

The first example is a study recently completed by Florio (1978). This study investigated one important aspect of learning to go to school, that is, how newcomers to a school situation acquire the interactional competence necessary to behave and interact effectively. Interactional competence refers to the appropriate use and interpretation of talk and nonverbal behavior in face-to-face communication. The study of interactional competence has developed out of sociolinguistics and communication and is primarily interested in how people learn to communicate appropriately in social contexts. Just as it is necessary for a person to be linguistically competent to use language appropriately, it is necessary for a person to be interactionally competent to act appropriately in social situations.

Sociolinguistic research has shown that membership in a group coming together regularly for purposes of communication is necessary for the acquisition of interactional competence. This is because much of what competent communicators must know operates unconsciously and is therefore not taught explicitly. Rather, it is acquired in the doing of social life. Research has also indicated the important influence of the shared social context in which people communicate. It has been suggested that appropriate communicative forms are matched to situational contexts so that being interactively competent involves knowing what context one is in and what behaviors are appropriate to that context.

Florio was primarily interested in how newcomers to school "learn" to become competent in what is interactionally a very complex situation. She focused on a kindergarten and first grade classroom to study this phenomena since breaches of appropriate interaction requiring the teachers to explicate interactional knowledge would be common and since she would have the opportunity to observe competent classroom communicators (first graders) and "newcomers" (kindergarteners) in the same contexts.

The method chosen for this study was ethnographic descriptions obtained as a participant observer combined with micro-analysis of videotaped accounts of large slices of classroom life. Also analyzed were viewing sessions where the teacher watched the videotapes and commented freely and in response to particular questions or directives from the researcher. In effect, this strategy provided a continuing alteration between the view available to an insider in the classroom and the perspective of one outside the classroom. Through this approach she was able to triangulate on key instances of behavior. The study was based on data collected over a two year period in the same classroom.

Florio found that the school day in this classroom was comprised of a series of interactional contexts. She identified two different kinds of activities that dominated classroom interaction. The first was whole class, single focus activity directed by the teacher, and the second type was more loosely organized, multi-focus activity in which the students initiated activity outside of the direct supervision of the teacher.

Florio took one event of the school day and analyzed the important interactional contexts of which it was comprised. This event was a

multi-focus activity called "worktime". She found four major contexts for interaction in work time: "getting ready", "focused time", "wind up", and "clean up". Each context was shown to have unique behavior demands, and analysis described how changes between contexts were signaled by the teacher.

The generation of theory in Florio's study evolved through continued interaction between the various forms of data and conceptualization. The product of this conceptualization was not a formal model or theory, but rather a set of theoretical statements about what is involved in the acquisition of interactional competence by newcomers to school. This grounded theory can be summarized by the following statements:[1]

1. The school day is comprised of a series of interactional contexts each placing particular behavioral demands on participants.
2. Being socially competent entails knowing what context one is in and what behavior is appropriate to that context.
3. Newcomers to school must learn to interpret appropriately the contextualization cues that participants make available to one another through interaction. To do this, newcomers must have sufficient experience in "getting through" contexts before interaction will begin to establish expectations about co-occurance so that changes in behavior may be appropriately associated with changes in presuppositions about status, role, and activity.
4. The recognition of contextual shifts is an important part of interactional competence. Since participants both

[1] I want to thank Susan Florio for providing this summary list of her theoretical statements.

create and interpret interactional contexts, it is necessary for them to keep each other informed by their linguistic and nonlinguistic behavior related to "who we are" and "what we are doing." In so doing, contextual shifts are effectively communicated ("cued") to each other.

5. In school, the teacher is the arbiter of social control, so much of the responsibility for cuing contextual shifts falls to her/him. However, since life in classrooms is jointly produced, behavior of the students influences the teacher's contextualizing behavior. In the highly evaluative climate of the school, a newcomer's failure to perceive or behave appropriately in response to contextualization cues can be misconstrued as evidence of intellectual deficiency, uncooperativeness, etc.

6. In school, the contexts for interaction cued by participants are frequently complex and multidimensional. It is not necessarily the case that all participants in a classroom lesson share the same interactional context or that each participant finds her/himself operating within only one context at any given time.

A second example of the generation of grounded theory in research on teaching is a study of teacher planning recently completed at the Institute for Research on Teaching (Yinger, 1977).

This study investigated teacher planning by means of a detailed case study of the processes involved in one elementary (first-second grade) teacher's planning decisions during a five month period of

instruction. The study was designed to address a need for descriptions and theoretical models of planning processes and to examine the usefulness of certain decision modeling methods for describing complex decisions as they occur in field settings. To accomplish this, the study used the perspectives and methodologies of both ethnography and information processing psychology.

The study involved two phases of data collection. In the first twelve weeks of the study, approximately forty full days were spent as a participant-observer, recording the teachers' activities in both the preactive and interactive phases of teaching. Also during this phase, the teacher's planning decisions were recorded as she "thought aloud" during her planning sessions. The second phase of the data collection further investigated the teacher's planning by observing her behavior in the Teacher Planning Shell (a simulation task developed for this study) and in three judgment tasks examining the teacher's perceptions of her students and instructional activities. Additional classroom observations and interviews were also conducted during this phase.

Two central aspects of the teacher's planning and instruction that emerged in this study were planning for instructional activities and the use of teaching routines. Activities were described as the basic structural units of planning and action in the classroom. They were self-contained, organizational units functioning as "controlled behavior settings" that were shaped and molded by the teacher to conform to her perceptions and purposes. Seven features of instructional activities were identified (location, structure and sequence, duration, participants, acceptable student behavior, instructional moves or

routines, and content and materials) and presented as important considerations in planning decisions.

Teaching routines emerged as another distinctive feature of the teacher's planning technology. Much of this teacher's planning behavior could be portrayed as the selection, organization,and sequencing of routines developed as a result of experience. Four types of teaching routines were described in this study: activity routines, instructional routines, management routines, and executive planning routines. Functionally, routines were characterized as methods used to reduce the complexity and increase the predictability of classroom activities, thus increasing flexibility and effectiveness.

In addition to the description of one teacher's planning, a goal of this study was to formulate a general model of the teacher planning process. The model had two major purposes: (1) to describe and represent in a schematic form speculations about the components of teacher planning and their interrelationships, and (2) to serve as a basis for further theory and research on teacher planning.

The process model developed in this study was grounded on three data bases. The first was the data collected in the field research portion of the study. By the end of the field research, many things were known about this teacher's planning. It was known that most of her planning focused on instructional activities. Many of these activities were well routinized, and by winter term planning time was taken up primarily by planning for social studies and science units. The teacher's planning could be described at five levels and each level could be distinguished in terms of goals, information used, the form of the plan, and the criteria for judging planning effectiveness.

Also, choice (the selection among alternatives) was not a prominent activity in her planning. Rather, it was characterized by the development and elaboration of activities over time. Furthermore, this elaboration took place as activities passed from general to more specific levels of planning. Also prominent in this teacher's planning was her reliance on past experience -- what seemed to work well or didn't work with previous classes.

The second source of data for this model came from other studies of teacher planning. Two findings of special interest to this model were the failure to identify objectives as a primary object of teacher decision making during the planning process (Zahorik, 1975; Peterson, Marx, and Clark, in press) and the lack of well developed alternatives in teachers' plans (Morine, 1976). Both of these findings supported the notion that teacher planning in practice is not characterized by processes advocated by the rational choice model of planning (Simon, 1957; Tyler, 1950). Rather than being dominated by decisions about objectives and alternatives, these studies indicated a greater concern for content and activities.

The third source of data for the model was psychological studies of problem solving and planning conducted in deliberative situations in mathematical problem solving (Selz, 1922, 1924), chess playing (de Groot, 1965), musical composition (Bahle, 1930, 1936), art (Getzels and Csickszentmihali, 1976), and architectural design (Eastman, 1970a, 1970b; Baer, 1976). The similarities among the situation in teacher planning and those of selecting a move in chess, composing a musical or visual composition, or planning for space utilization in a building

suggested the usefulness of adopting concepts from research on these thinking processes.

The focus of the planning model generated in this study is on the individual, preactive, deliberative information processing involved in planning from an initial idea to its implementation. The model deviates from traditional models of planning primarily in that the emphasis is on the discovery and design processes in planning rather than on the choice processes. In short, the model portrays planning as "purposeful problem solving" as opposed to "rational choice."

Three stages of planning are represented in the process model:

Stage I - Problem Finding

Stage II - Problem Formulation/Solution (Design)

Stage III - Implementation, Evaluation and Routinization.

Problem finding refers to the process of becoming aware of what specific problem needs to be solved within a general, non-specified problem situation. In the context of teacher planning, problem finding refers to the "discovery" of a potential instructional idea that requires further planning and deliberation. This idea is referred to as a "problem" since at this stage in planning it is still not known if this idea can be realized in the classroom and, if so, how it will be done.

Problem finding is portrayed as involving interaction among the planning dilemma confronting the teacher (arising from the general teaching dilemma), teaching knowledge and experience, teaching goals, and the teaching materials available. The sensing, searching, generating, and manipulating of ideas based on these elements is referred to as

the discovery cycle. The result of this cycle is a statement of a problem (idea) in the form of an "initial problem conception" which becomes the basis for further elaboration (planning).

The second stage in the model of teacher planning involves problem formulation and solution. The basic assumption made in this stage is that problem formulation is an essential element in problem solving and that the two processes proceed hand-in-hand. The interweaving of these two processes is necessary because of the openness of the planning problem situation. Before a problem may be solved, it must first be discovered and then formulated into a manageable state.

The primary mechanism of problem formulation and solution is referred to as the design cycle. Here problem solving is portrayed as a design process involving progressive elaboration of plans or activities over time. The dominant feature of the design cycle is its phase structure. The progressive development and solution of the planning problem takes place as it cycles through phases of elaboration, investigation and adaptation. As a problem progresses through these three phases of design, two major aspects of the thought process are involved. Elaboration and investigation draw on the planner's repertoire of problem solving methods (knowledge and experience), and adaptation is based upon the planner's total problem conception.

There are two other important general features of the design cycle. First, the process is serial in nature and only one problem is elaborated at a time. Elaboration, investigation, and adaptation continue until the problem is "solved" or until it is rejected as unworkable. The second feature is that the process happens over time. The length

of the cycle can vary, however. At its longest, the cycle may continue across several levels of planning. For instance, a unit activity might be progressively planned over a period of several weeks. At the other extreme, the cycle may last only minutes if an initial problem conception requires only minor elaboration to become workable or if it is quickly rejected after several cycles because of the discovery of a major obstacle to its potential workability.

The final stage of the model is where the activity is actually implemented and evaluated in the classroom. It is not preactive planning, as such, but it does provide the final link in the instructional planning process. It reflects the provisional nature of the results of the design process by proposing an actual "trying out" of the solution followed by an evaluation. Also, the results of this process feed back to and build up the repertoire of knowledge and experience which, in turn, becomes an important component in subsequent planning.

Summary and Conclusions

It has been the purpose of this paper to present a case for a new emphasis on theory generation in research on teaching. It has been argued that research in this area of education is in need of a healthy dose of conceptual effort to build a theoretical base for the interpretation of current research and for the guidance of research in the future.

Some of the problems contributing to the current dearth of educational theorizing were discussed, focusing on generally held conceptions about the nature of theorizing and the lack of theoretical training

of most researchers. Several different notions of theory and theory building were presented with a focus on grounded theory (a la Glaser and Strauss).

Grounded theory was proposed as a practical method of theory building based on field research data. This technique regards theory generation as an integral part of the research process, and promotes an on-going conceptual interaction with the data. Two examples from research on teaching illustrated the possibility of developing grounded theory from field based research. Yinger's study of teacher planning showed that this method of theoretical conceptualization is amenable to cognitive research as well as to the kind of social research illustrated by Florio's study of interactional competence. These two examples also illustrated the variety of theoretical products that grounded theory may generate. Yinger's theoretical work has been summarized by a conceptual model of the teacher planning process while Florio's work has produced a series of theoretical statements about the acquisition of interactional competence.

Untilnow, this discussion of grounded theory has focused on advocating a method for the generation of descriptive theory in research on teaching. Grounded theory may also be an effective method for the generation of prescriptive theory.

Research in education should be concerned about "what should be" in teaching and learning as well as with "what is". It has been argued (Schwab, 1969) that normative models of education must be grounded on both the descriptive and the theoretical. Research needs to establish a dialectic between theory and practice, since neither source alone

is sufficient as a basis for prescriptive models of action. Theory when generated apart from practice deals with the problem abstractly and can unrealistically narrow the real state of affairs. This is of little value to the practitioner since he is not able to do this, but must operate with concrete instances in all their complexity. One cannot take the opposite stance and use current practice as the sole criterion, either. A problem with most practice is that once it seems to be functioning satisfactorily, other alternatives are rarely considered even though they may be more efficient or effective. Thus, theory and practice must supplement each other by means of practical deliberation and reason. The generation of grounded theory from field research may be a good way to establish this long needed dialectic.

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